

An Apparatus and Method for a Real Time Movie Editing Device

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CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application No.
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BACKGROUND OF THE INVENTION

In general, movies contain a certain amount of material offensive to certain viewers. Movies are presently rated by a G, PG, PG-13, R, or NC-17 rating that tries to warn a movie viewer of the amount of offensive material in a movie. Often, a movie
10 viewer would like to watch a certain movie because of its desirable characteristics (like plot or a certain actor/actress), however, because of offensive material (reflected by the movie rating) the movie viewer does not view the movie. Many movie viewers would view a certain movie if it had a lower rating, for example, a PG rating instead of an R rating. Other movie viewers watch a movie with a desirable rating, but would still prefer
15 that a few offensive words and/or scenes were edited out. Also, parents often would like to edit out some offensive scenes and/or dialogue for their children. A method for editing out offensive scenes and/or dialogue is very desirable.

One method for editing movies is for the user to edit out the offensive scenes and dialogue manually. This method requires the user to either cut and tape the video tape,
20 fast-forward or mute the DVD player or video tape player during the offensive scene, or turn off the television and/or mute the volume during offensive scenes if played by way of cable or satellite television. The first method requires the user to purchase the movie in order to edit it. Also, the user is required to view the offensive scenes in order to be

able to edit them. The other two methods are ineffective because the user must view
25 and/or listen to the beginning of the offensive material in order to edit the scenes. Also,
the user will not know when to return to normal viewing because the user does not know
when the offensive material ends. This method is not very desirable and generally not
used because of the difficulty of the method.

Another method for censoring movies is to use the closed captioning information
30 available on line 21 of many video signals. This method involves comparing words in
the closed caption information with a list of offensive words. If an offensive word is
found in the closed captioning, the closed captioning is altered to delete the offensive
word and the audio is muted. Because the closed captioning does not always match up
exactly with the audio signal, sometimes the audio is not muted at the exact time that the
35 word is actually being spoken in the movie. Some offensive words may still be played
for the user even with the censoring device on. Also, the user is not allowed to edit out
offensive scenes because that information is not contained in the closed captioning. This
method is not very desirable because of the lack of flexibility and the less than 100%
accuracy of this method.

40 A possible solution to the aforementioned problems is to publish a time that the
video should be blanked and/or the audio muted because of offensive scenes and/or
dialogue. The movie viewer could view the movie and when the movie time displayed
on the VCR or DVD player is during an offensive scene or dialogue, the user could turn
off the TV or mute the volume. This method may filter out some or most of the offensive
45 material, but a good amount of material will still be played because of the limitations of
the method.

First, the time of the movie reflected on the VCR or the DVD player is often not very accurate. Second, the time on the VCR or DVD player is generally only accurate to the second range. Generally, an offensive word or scene will not begin or end right on the second. This means that either some offensive material will not be edited out or non-offensive material will be edited out. Third, this method is limited by the quickness of the user. If the user is not quick enough to mute and/or turn off the TV at the appropriate time, offensive material will be displayed. Last, requiring the user to keep track of time will be a distraction and detract from the movie viewing experience. Thus, there is a need in the art for a device that edits out offensive material based on the movie time with a high degree of accuracy and precision without requiring any effort from the user during the movie.

BRIEF SUMMARY OF THE INVENTION

The present invention allows a user to edit out offensive scenes and/or dialogue from any movie by discovering the exact time of the location of the movie. When the exact time of the location of the movie is known, a movie may be edited based on editing data that corresponds to the time in the movie when offensive material occurs. A user downloads a file from the Internet that contains timing and editing data for a movie the user desires to watch. The file is selected based on the amount of editing the user desires. For example, the user may select a lower rating for a movie that is rated R in its normal format. After downloading the timing data and editing data file, the user plays the movie by way of any traditional method (VCR, DVD player, cable or satellite TV, or other device) in conjunction with the present invention.

70 The present invention determines the location of the movie based on a comparison of the audio and/or video inputs from the movie being played and the downloaded timing data. In this manner, the present invention discovers the location of the movie and then uses the editing data to turn off the video output ("blanking") and/or mute the audio during offensive scenes and/or dialogue.

75 It is an advantage of the present invention to provide a device that allows a user to view a movie with offensive scenes and/or dialogue edited out without requiring the user to expend any effort during movie viewing.

80 It is a further advantage of the present invention to provide an editing device that uses the audio and/or video signal from a movie to edit out offensive scenes and/or dialogue with an extremely high degree of accuracy.

85 It is a further advantage of the present invention to provide an editing device that functions with any type of device that has an audio/video output independent of the speed at which the device plays the movie.

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BRIEF DESCRIPTION OF THE DRAWINGS

The previously stated and other advantages of the present invention will be more readily ascertainable with a description of a preferred embodiment in conjunction with the following drawings.

90 Figure 1 is a block diagram of the present invention.

Figure 2 is a more detailed block diagram of a real time editing device and its components.

Figure 3 is an example of a portion of typical timing data.

Figure 4 is an alternative embodiment of the present invention.

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DETAILED DESCRIPTION OF THE INVENTION

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and 100 will herein be described in detail. It should be understood, however, that the detailed description is not intended to limit the invention to the particular forms disclosed. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

Fig 1 is an illustration of the preferred embodiment of the present invention.

105 Audio/video outputs from an audio/video device **105** are connected to a real time editing device **110**. The audio/video device **105** may be a DVD player, VCR, satellite or cable TV decoder, WebTV, or any other device that produces an audio/video output. The real time editing device **110** is also connected to an audio/video display device **115** and an Internet connection device **100**. Typically, the audio/video display device **115** is a 110 television set, however any device with audio/video inputs may be used. Optionally, the audio/video playing device **115** may include a stereo or surround sound system that only receives an audio input from the real time editing device **110**. The Internet connection device **100** usually is a computer, webTV, or other device that is connected by the Internet to the world wide web.

115 Often, a movie viewer desires to watch a certain movie, but because of offensive scenes or dialogue the user will not view the movie. The present invention allows a user to edit out unwanted scenes or dialogue during real time viewing without physically altering the movie. First, the user selects the desired movie, either by renting the video cassette or DVD, receiving the movie over satellite, cable TV, or through the Internet, or
120 by some other means. Before the movie is shown, the user uses the Internet connection device **100** to access a website that contains editing and timing data for the desired movie. Typically the user will be able to select a certain amount of editing. For example, if the movie is rated R, the user will be able to select editing data for a lower rated (similar to a PG rating) version of the movie. Obviously, other means of classifying an
125 amount or type of editing done may be used, however the method stated is one familiar to most people. The timing data and the desired version of the editing data is downloaded to the Internet connection device **100** then transferred to the real time editing device **110**.

The editing data contains the locations in the movie where offensive scenes should be blanked and/or the audio output should be muted. When the user plays the
130 movie by way of the audio/video device **105**, the real time editing device **110** first uses the timing data to synchronize with the movie. Once synchronization occurs, the real time editing device **110** compares the location of the movie to the editing data and mutes the audio signal and/or blanks the video signal to the audio/video display device **115** in the appropriate locations of the movie. Thus the real time editing device allows the user
135 to view the desired movie without needing to view unwanted scenes or hear unwanted dialogue.

A more detailed description of the real time editing device 110, as illustrated in Fig 2, will better describe the preferred embodiment of the present invention. The real time editing device 110 comprises two parts: a switch pack 200 and a transfer pack 205.

140 Typically, a user has the audio/video display device 115 and the audio/video device 105 near each other, but the Internet connection device 100 is far apart or in a separate location. Having two parts to the real time editing device allows the user to leave the switch pack 200 connected to the audio/video display device 115 and the audio/video device 105 while the transfer pack 205 is taken to the Internet connection device 100 in

145 the other location. The transfer pack 205 is easily disconnected from the Internet connection device 100 and reconnected to the switch pack 200 without needing to reconnect any wires from any other devices.

The switch pack 200 comprises: an audio/video input 210, audio/video output 215, audio/video switches 220, synchronization unit 230, and a transfer pack interface 225. The transfer pack 205 comprises: a processor unit 240, memory 245, switch pack interface 235, and an Internet connection device interface 250. When the user desires to edit out unwanted parts of a movie, the user connects the transfer pack 205 to the Internet connection device 100 by way of the Internet connection device interface 250. The user selects the desired editing and timing data as previously described and downloads it to the

150 Internet connection device 100. The editing data contains information of the exact time that the audio/video display device 115 should be blanked and when the audio should be muted, and the duration of the blanking or muting. These times are then loaded and stored in the memory 245 (preferably static random access memory or any other memory component capable of reading and writing data) by the processor unit 240.

160 After the transfer is complete, the user disconnects the transfer pack **205** from the Internet connection device **100** and connects the transfer pack **205** to the switch pack **200**. The processor unit **240** is then connected to the audio/video switches **220** and synchronization unit **230** by way of the switch pack interface **235** and transfer pack interface **225**. The audio/video switches **220** (or any other device capable of switching) 165 are connected to the synchronization unit **230**, audio/video device **105** by way of the audio/video input **210**, and the audio/video display device **115** by way of the audio/video output **215**.

In the preferred embodiment of the present invention, the closed captioning component of the input video signal is used for synchronizing the real time editing device 170 **110** with the input video signal from the audio/video device **105**. The timing data contains a compilation of the number of ASCII characters in each closed captioning sentence of the entire movie. Also, the timing data contains the time (within 1/60th of a second) associated with the number of ASCII characters of each closed captioning sentence. Generating the timing data comprises starting a movie at the same time a clock 175 is reset. When a closed captioning sentence ends, line 21 of the video signal contains seven low bits and a high parity bit. When this bit sequence is received, the end of the closed captioning sentence is reached. The number of ASCII characters in the sentence is counted and stored along with the time (taken from the clock) the parity bit was received. The time at the end of each closed captioning sentence can be used as a time mark in 180 order to map out the entire movie for editing purposes. This method is advantageous because the closed captioning sentence does not need to be decoded which would require more processor cycles.

For example, if the first line 21 closed captioning sentence of the movie is "It was
love at first sight", the first value stored in the timing data portion of the memory **245** will
185 be 26 (excluding header and ending bits). If the end of the closed captioning sentence
occurred at zero hours, zero minutes, 2 seconds, and 25/60ths of a second (based on the
clock), this value will be stored along with the number of ASCII characters in the
sentence (26). The second memory location in the timing data will contain the number of
ASCII characters in the second closed captioning sentence along with its associated time.
190 The rest of the timing data continues the same pattern for the entire movie.

In order to synchronize with a movie being played by the audio/video device **105**,
the real time editing device **110** first determines the number of ASCII characters from the
closed captioning portion of the input video signal from the audio/video device **105**. To
accomplish this, the synchronization unit **230** receives the input video signal from the
195 audio/video switches **220** and sends an interrupt to the processor unit **240** during every
vertical blanking period. After a period of time, the processor unit **240** samples the
output of the synchronization unit **230** during line 21 of the input video signal. The
processor unit **240** increments a counter each time a character is detected. The processor
unit **240** detects the end of the sentence when the seven low bits and one high parity bit
200 are received. The counter contains a first number that represents the number of ASCII
characters from the first closed captioning sentence received from the input video signal.
The processor unit **240** then compares the first number to the timing data stored in
memory **245**.

The processor unit **240** begins comparing the first number to the value found at
205 the first line of the timing data stored in the memory **245**. If the first number does not

equal the value in the first memory location of the timing data, a match is not found and the processor unit **240** continues on comparing at the next memory location until a match is found. When a match is found, the processor unit **240** gets a second number that represents the number of ASCII characters from the second closed captioning sentence
210 received from the input video signal. The processor unit **240** compares the second number to the value found in the memory location following the first matching location. If the value is the same, the processor unit **240** continues the same process until four matches are found.

If one of the numbers does not match up, the processor unit **240** skips to the next
215 memory location following the first matching location and compares the first number to the value stored. The process then continues as previously described until four matches are made.

An example of the matching process is illustrated in Fig 3. Here, typical timing data is illustrated in the memory. The memory location is labeled for ease of reference
220 for this example, but is not necessarily contained in memory. Each memory location number corresponds to every closed captioning sentence of the entire movie. For example, the first memory location contains the data corresponding to the first closed captioning sentence of the movie. The first column of memory contains the number of ASCII characters found in the corresponding closed captioning sentence. The second
225 column of memory contains the time stamp associated with the same closed captioning sentence. In this example, memory location 2055 (or in other words, the 2055th closed captioning sentence) contains 23 ASCII characters and the sentence ended at 1 hour, 36 minutes, 33 seconds, and 15/60ths of a second from the beginning of the movie.

If the user begins a movie at an arbitrary location, the real time editing device 110
230 begins the synchronization process by comparing the number of ASCII characters found
in the first closed captioning sentence received from the input video signal to the number
of characters found in the first memory location. In this example, the first closed
captioning sentence received contains 27 ASCII characters. After comparing 27 to all of
the previous memory locations, the processor unit 240 finds a match at memory location
235 2056. In this example, the next closed captioning sentence received from the input video
signal has 40 ASCII characters. The processor unit 240 compares 40 with the number of
characters found in memory location 2057. Since memory location 2057 contains the
number 18, a match is not made.

The processor unit 240 then starts over by comparing 40 to the number of
240 characters found in memory location 2057. A match is not made until memory location
2059. The processor unit 240 then compares the second closed captioning sentence
number of characters to memory location 2060. A match is made because the location
contains the number 40. In this example, the third closed captioning sentence contains 33
ASCII characters. The processor unit 240 compares 33 to the next number of characters
245 found in memory location 2061. A match is not made, so the processor unit 240 begins
comparing the number of ASCII characters from the first closed captioning sentence at
memory location 2060.

A match is not made until memory location 2065. The processor unit 240
compares the number of ASCII characters in the second closed captioning sentence to the
250 number of characters found in memory location 2066 and finds a match. The processor
unit 240 also finds a match between the number of characters in memory location 2067

and the number of characters in the third closed captioning sentence. In this example, the
fourth closed captioning sentence contains 52 ASCII characters. The processor unit **240**
compares 52 to the number of characters found in memory location 2068. A match is
made and the synchronization process is complete because four matches in a row are
made.

In general, requiring four matches will ensure that the real time editing device **110**
is synchronized with the movie, although requiring more or less can be done according to
the accuracy desired. This method of synchronization is advantageous because no matter
where the user begins viewing a movie, the real time editing device **110** will synchronize
with the movie location. Typically, the real time editing device **110** will need to re-
synchronize with the input video signal often in case the user fast-forwards, rewinds, or
pauses the movie. Also, re-synchronization takes place because different audio/video
devices **105** play the movie faster or slower than others. Re-synchronization ensures that
the real-time editing device will not miss an offensive scene and/or dialogue.

After four matches are made, the processor unit **240** restarts a clock with the value
contained in the timing mark location of the fourth matching location. In this example,
the clock is reset to a value of 1 hour, 37 minutes, 10 seconds, and 23/60ths of a second.
The clock proceeds to keep track of time and the editing process is initiated.

In the preferred embodiment of the present invention, the editing data contains the
times when the audio should be muted and/or the video blanked and the times that the
audio and/or video should return to normal viewing. After synchronization is complete
and the clock is running, the processor unit **240** checks the editing data to determine if the
audio and/or video should be turned off. The processor unit **240** compares the movie

275 time present on the clock with the times stored in the editing data. If the time present on
the clock is greater than the time the audio should be muted and less than the time the
audio should be returned to normal, the processor unit **240** causes the audio/video
switches **220** to turn off the audio output to the audio/video display device **115** until the
clock is greater than or equal to the time the audio should return to normal listening. If
280 the time present on the clock is greater than the time the video should be blanked and less
than the time the video should be returned to normal, the processor unit **240** causes the
audio/video switches **220** to turn off the video output to the audio/video display device
115 until the clock is equal to/greater than the time the video should return to normal
viewing. In this manner, the present invention edits out offensive scenes and/or dialogue
285 even if the movie is started in the middle of an offensive scene and/or dialogue.

Editing data is compiled based on what scenes and/or dialogue should be edited
out to achieve a certain rating for a movie. Alternative forms of editing data could be
made available based on what types of words and/or scenes a user finds offensive. Since
the editing data is accurate to 1/60th of a second, the present invention allows for a very
290 high degree of accuracy of editing out offensive scenes and/or dialogue. A compiler of
the editing data can watch the movie with the editing data to verify that the video and/or
audio is turned off at exactly the right location. If not, the compiler of the editing data
can change the editing data to achieve 100% accuracy in the deletion of offensive scenes
and/or dialogue. Thus, the present invention will not allow an unwanted scene and/or
295 dialogue to be played, thereby overcoming the previously discussed accuracy limitations
of the prior art.

When the transfer pack **205** is disconnected, there is no movie information loaded into memory **245**, or the transfer pack **205** is off the audio/video switches **220** connect any input signal from the audio/video input **210** to the audio/video output **215**. In this
300 manner, when the real time editing device **110** is not in active mode, the user continues normal viewing without needing to connect or disconnect any wires. Any input audio/video signal (from a VCR, DVD player, cable TV or satellite TV, or other audio/video input) will proceed unchanged and unedited through the real time editing device **110** to the audio/video display device **115**.

305 An alternative embodiment of the present invention is illustrated in Fig 4. Here, a real time editing device **355** comprises many of the same components as the real time editing device **110** of Fig 2, however, the real time editing device **310** is not split into a transfer pack and switch pack. Some movie viewers have the Internet connection device **100** located nearby the audio/video display device **115** and the audio/video device **105**.
310 In this situation, the real time editing device **355** remains connected to the audio/video display device **115** by way of an audio/video output **315**, Internet connection device **100** by way of an Internet connection device interface **350**, and to the audio/video device **105** by way of an audio/video input **310**.

The alternative embodiment functions in the same manner as the preferred
315 embodiment. Editing and timing data is downloaded onto the Internet connection device **100**. The processor unit **340** then transfers the editing and timing data from the internet connection device **100** (by way of the Internet connection interface **350**) to the memory **345**. When the desired movie is played, the real time editing device **355** synchronizes itself with the movie in the manner previously described. Offensive scenes are blanked

320 out and offensive dialogue is muted in accordance with the editing data stored in memory
345, as previously described. Thus, the user is allowed to use the present invention without needing to detach a transfer pack from a switch pack in order to download the editing and timing data.

An alternative embodiment of the present invention samples the audio input from
325 the audio/video device **105** in order to synchronize with the movie. This embodiment may be used if closed captioning information is not available. In this embodiment, the timing data contains the values assigned to the audio input for the entire movie. When the movie is played, the present invention samples and digitizes the audio and compares the value with those stored in the timing data. This method is as accurate as the preferred
330 embodiment, however it requires much more memory and more processor cycles based on the accuracy desired. A similar method may be implemented using the video signal instead of the audio signal.

Other modifications to the present invention may be made. One modification is to make the switch pack **200** and the transfer pack **205** communicate by way of a wireless connection. This would allow the transfer pack **205** to remain with the Internet
335 connection device **100** and the switch pack **200** to remain with the audio/video display device **115** and the audio/video device **105**.

Another modification is to include the present invention inside a VCR, DVD player, or cable TV, satellite TV, Internet connection device, or WebTV decoder. In this
340 case, the present invention could be modified to include information for a VCR or DVD player to fast-forward to the end of an offensive scene while blanking the screen.

Another modification is to store in the timing data the ASCII characters for each closed captioning sentence instead of the number of ASCII characters in each sentence.

This method would require the real time editing device to decode each ASCII character
345 of each closed captioning sentence and compare the sentence with the sentences stored in memory. This is not very efficient because it requires more memory and more processor cycles for the comparison. Other modifications are possible that fall within the spirit and scope of the present invention.

Also, the present invention could be modified to allow a user to select a desired
350 rating level for all movies viewed. When a movie is played, the present invention could have a connection (either a direct connection over a phone line or a connection through the Internet) to a database containing all of the editing and timing files for all movies available. The present invention would then download the pertinent file (if it is available) to the real time editing device. The present invention would then edit out offensive
355 material as previously described.

Other modifications and improvements will occur to those skilled in the art upon a reading of the foregoing description. It should be understood that all such modifications and improvements have been deleted herein for the sake of conciseness and readability but are properly within the scope of the following claims. Thus, the
360 corresponding structures, materials, acts, and equivalents of all means or step plus function elements in the claims are intended to include any structure, material, or acts for performing the functions in combination with other elements as specifically claimed.